

MIGRANT REMITTANCES AND CORRUPTION: An Empirical Analysis

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This study revisits the sources of corruption using a panel data for 122 countries. It contributes to the literature by analyzing the relationship between remittance and corruption with particular focus on analysis of distribution of dependent variable (corruption). In cross sectional and panel settings, it is found that 'one standard deviation' increases the remittance variable in association with an increase in corruption of 0.33 points, or 25 per cent of a standard deviation in the corruption index. It is also investigated whether greater remittances consistently increase corruption, among the most and least corrupt countries. Result of this shows that among the least corrupt countries, remittances do not appear to increase corruption but, among most corrupt countries, it significantly promotes corruption. Findings of this study are robust to different samples specifications, to regional effects and to the alternative econometric techniques.

I. Introduction

Corruption around the world is believed to be endemic and pervasive, a significant contributor to low economic growth, to stifle investment, to inhibit the provision of public services and to increase inequality to such an extent that international organizations such as, the World Bank has identified corruption as 'the single greatest obstacle to economic and social development' [World Bank(2001)]. Although, corruption has become a norm in many countries, but still it is disliked for its detrimental effects on development. The elimination of widespread corruption and the promotion of fairness in the markets are at the core of development concerns and a principal policy objective of all countries.

Research on determinants and effects of corruption has proliferated in the recent years [Lambsdorff (2006), for an excellent review of the relevant literature]. Cross-country empirical studies of the causes of corruption have investigated a wide range of factors, such as economic, cultural, political and institutional aspects. Following this research, a consensus on some determinants of corruption is slowly emerging, though several aspects remain unclear; for example, the role of government and openness to trade in determining corruption remain unresolved.

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In recent years, there is a growing research interest, relating to remittance and different macroeconomic variables; whereas remittance exerts favorable macroeconomic effects through ameliorating poverty and increasing investment and saving. It is also observed that remittance exerts adverse macroeconomic effects through channels of appreciation of exchange rate, increasing inflation and adverse effect on labor market participation [Chami, et al. (2003), Barajas, et al. (2008)]. The mixed results provide less incentive to government to initiate structural reforms to increase remittance inflows.

How does remittance affect corruption? Surprisingly, little attention has been paid to this issue. Past literature has largely neglected the corruption-impact of remittance; but recently, Abdih, et al.(2012) shows empirically that remittance affect adversely the quality of institutions. However, their study ignores the importance of existing level of corruption in determining corruption impact of remittance. The present study attempts to fill the lacuna by investigating corruption-impact of remittance for a large set of countries over a long period with special focus on the role of distributional profile of corruption. The present study adds to the emerging literature on corruption by addressing the following questions: (1) Do remittance promote corruption? (2) Does the effect of remittance on corruption depend on the distribution of dependent variable? (3) What is the role of government?

This study differs from the existing literature on corruption in several important ways: First, this is a systematic panel data study that rigorously examines the impact of remittance on corruption. Second, the study contributes to the existing literature on sources of corruption by analyzing the distribution of dependent variable (corruption), in relation to remittance. Third, the study provides better explanation of inconclusive causes of corruption (for example, government spending), using the recent data set. Fourth, the study uses both, the cross sectional and panel data sets over along period as compared to the past literature which is based on one or few years. Fifth, the study uses alternative econometrics techniques to assess the robustness of results and to address the problem of endogeneity.

Rest of the discussion is structured as follows: Section II provide review of the related literature. Section III, briefly describes the data issues and, Section IV provides an analytical framework for the study. Section V reports results and discussion and finally, Section VI concludes.

II. Review of Literature

Whether remittance contributes positively or negatively to macroeconomic performance of a recipient economy is a controversial issue in theoretical and empirical studies. Many empirical studies assess the effect of remittance on the recipient economy's performance and reach different conclusions, despite using the same data sources [see, for example, Barajas (2008)].

The negative macroeconomic consequences of remittance are channelized through labor market. It is expected that remittance receipts exert a negative influence on labor force participation for the following reasons. First, the households are likely to substitute unearned remittance income for labor income because its inflows are simple income transfers. Second, Chami, et al. (2003), argue that irrespective of the intended use of remittance, there are various moral hazard problems linked with its receipts. Third, remittance monitoring and management is extremely difficult because its senders and receivers are separated by a distance which is sent under asymmetric information. Thus, moral hazard problems may induce an individual to spend resources on leisure and reduce labor work.

Barajas, et al. (2008) argued that availability of remittance inflows decreases motivation of individuals to monitor and evaluate the domestic governments' policy performance. The remittance inflows creates a moral hazard problem as cost of poor performance of the domestic government which is at least partially shifted to the remittance sender; because, when things go wrong at home, remittance transfer is likely to increase. The main point of this argument is that high remittance inflow may undermine good domestic governance. This argument can be focused on a specific aspect of the quality of domestic institutions, which is corruption.

In a recent study, Abdih, et al. (2012) examined the relationship between remittance and the quality of institutions. Their analysis shows that remittance exerts negative influence on quality of institutions. Individuals with high remittance do not take account of the quality of domestic institutions and prefer to solve their economic issues through remittance senders and may use this unearned money to 'grease the wheels' for speedy work in public sectors.

The role of government in relation to corruption is critical. However, both theoretical and empirical studies predict conflicting relationship between government spending and corruption. Rose-Ackerman (1999) argues that a larger government contributes to bureaucracy can foster corruption. On the other hand, La Porta, et al. (1999) argues that a larger government may spend more with stronger check and balance to control corruption, thereby decreasing corruption.

III. Data Description

The data set for this study is taken from various sources. A detail description of variables and their sources is given in (Appendix) Table 1. In this study, the International Country Risk Guide's corruption index has been used. It has also been used more commonly in the corruption studies issues. This index captures the likelihood that government officials will demand special allowance/incentives. Other than allowing consistency to the previous studies and spanning over a long period, this index allows to use maximize our sample size to 122 countries.

Further, it is highly correlated to other corruption indices which are used in the literature, such as, corruption indices by Transparency International and Business International [see, Treisman (2000) and, Majeed and MacDonald (2010) for more details]. The high correlations between different indices suggest that they are consistent, despite their subjective rating. Year-to-year change, the corruption index is not very informative because of measurement errors; and to avoid this problem the data is arranged into a panel of five-year averages.

IV. Framework of Analysis and Estimation Technique

In order to evaluate the effect of remittance on corruption, the work of Abdih, et al. (2012) is followed with some modifications. The relationship between remittance and corruption has been developed in the following theoretical model.

1. *The Representative Agent Problems*

Households care about consumption of private goods, as well as, the public services. Government provision is taken for latter to be exogenous and consumption of two types of goods, x and y , are chosen to maximize:

$$U(x, y, w) = \alpha \log(x) + (1 - \alpha) \log(y + w) \quad (1)$$

where x is the agent's consumption of private good, and y is the agent's consumption of a good, that is perfect substitute for public goods; while, w is the level of government provision of public goods. The agent's budget constraint is as follows:

$$(1 - t) m + R = P_x^* x + P_y^* y \quad (2)$$

Maximizing Equations (1), subject to (2) gives:

$$U(x, y, w) = \alpha \log(x) + (1 - \alpha) \log(y + w) + \lambda [(1 - t)m + R - x - y].$$

First Order Conditions,

$$\begin{aligned} \alpha/x - \lambda &= 0, \\ 1 - \alpha / (y+w) - \lambda &= 0, \\ (1 - t) m + R - x - y &= 0. \end{aligned}$$

After some manipulation with λ Equations, expression for x can be written as:

$$X = (\alpha / 1 - \alpha) (y + w).$$

Now substituting the expression for x into budget constraint,

$$\begin{aligned}(1-t)m + R - x - y &= 0, \\ y &= [(1-t)m + R] - x, \\ y &= [(1-t)m + R] - [(\alpha/1-\alpha)(y+w)], \\ (1-\alpha)y + \alpha y &= (1-\alpha)[(1-t)m + R] - \alpha w\end{aligned}$$

Finally, we get the following optimal value for y ,

$$y^* = (1-\alpha)[(1-t)m + R] - \alpha w \quad (3)$$

Therefore, taking the level of government provision of public goods, as given, private purchases of these goods are increasing in household disposable income (domestic and foreign) and decreasing in the government's provision. This result is intuitive when households prefer to keep relatively, the constants hare of goods in their consumption basket. A higher endowment in certain goods (w) will decrease the demand of these goods (y), everything else equal, and increase consumption of the other goods (x).

2. *The Government's Behaviour*

The central assumption in this model is that the government does not behave like a central planner. In particular, suppose the government cares about maximizing a combination of representative agent's utility and its own utility, derived from resources that government reserves for itself. In such a case the government, problem consists of maximizing:

$$\Psi(w, U) = \beta \log(s) + (1-\beta) U(x, y, w) \quad (4)$$

where s stands for whatever the government keeps for its own consumption. The government choose w to maximize Equation (4), subject to the budget constraint:

$$tm = w + s \quad (5)$$

Thus, the government essentially choose, as to how much of the resources which it collects can be diverted for its own purposes.

3. *Stackelberg Game*

Since the government knows the problem of representative agents, therefore in reaction to its own spending decisions by the private agents, the government will

take this reaction into account in its optimization problem. However, since it is highly unlikely that private agents would cooperate to play a Nash Bargaining game with the government, therefore, it is most natural to assume that individual private agents would take the government's provision of public goods, as fixed and unaffected by their actions. For example, if all agents decrease their private consumption of public goods, they might be able to force the government to increase its own spending; however, such an assumption would not be realistic. Therefore, we assume that our model economy works as a Stackleberg game where government moves first. Under this assumption, replacing Equations (3) and (2) in the objective function of the government, the yields follows is as:

$$\Psi(w) = \beta \log(tm-w) + (1-\beta) \{ \alpha \log[\alpha((1-t)m + R + w)] + (1-\alpha) \log[(1-\alpha)(1-t)m + R + w] \},$$

which simplifies to:

$$\Psi(w) = \beta \log(tm - w) + (1-\beta) [\alpha \log(\alpha) + (1-\alpha) \log(1-\alpha) + \log[(1-t)m + R + w]] \quad (6)$$

When $\Psi(w)$ is maximized with respect to w it yields:

$$w^* = (t - \beta)m - \beta R \quad (7)$$

Equation (7), simply says that provision of public goods is increasing in the tax base, m , but decreasing in the amount of (non-taxed) remittance. The substitutability between private and public provision of good y , however, implies that an increase in the tax base m does not fully translate into an increase in provision of public good w . Instead, a part of increase in the revenue base, include remittance and $\beta(m+R)$ is diverted to the government's own consumption. Given this optimal level of spending on public goods, it can be easily derived that optimal level of resources are diverted to the government's own consumption:

$$s^* = \beta(m + R) \quad (8)$$

It may be, noted that the amount diverted does not depend on the tax rate, but it increases the revenue base, that is, income and remittance. The 'fiscal space' provided by the revenue base (in particular, the remittance) increases the household's private consumption of both goods (x, y), which allows the government to free ride and reduce its contribution to the public good, thereby increasing its own consumption. It is also clear that the government's proclivity to divert resources to its own consumption is measured by β , leaves the household worse-off in equilibrium: replacing Equations (3) and (7) to Equation (1), the following is obtained:

$$\partial U(x^*, y^*, w^*) / \partial \beta = \beta(1 - \alpha) / (1 - \beta) < 0 \quad (9)$$

The author of this study is interested in the ratio of resource diversion, either to the total government spending:

$$s^* / w^* = \beta m + \beta R / (t - \beta)m - \beta R = \beta(1 + R / m) / (t - \beta) - R / m \quad (10)$$

or to the total income,

$$s^* / y = \beta(1 + R / m) \quad (11)$$

As one can easily see:

$$\partial (s^* / m) / \partial R = \beta / m > 0 \text{ and } \partial (s^* / w^*) / \partial R = \beta t m / [(t - \beta)m - \beta R^2] > 0.$$

These measures of the corruption increase the level of remittance. It may also be noted that Equations (10) and (11) indicate that corruption is potentially higher in countries where ratio of remittance to GDP is high. To identify the variables that cause corruption the theoretical and empirical literature on this topic is drawn extensively. As a starting point, theories on the sources of corruption mentioned in Treisman (2000) and La Porta, et al. (1999) are taken into consideration. Those studies are considered a benchmark in the literature and provide a powerful battery for empirical tests. The most recent findings of the empirically backed literature are added in order to test and build their findings. Following theoretical arguments and other empirical studies along with corruption the model is as follows:

$$C_{it} = \beta_1 Rem_{it} + \beta_2 Y_{it} + \beta_3 X_{it} + \mu_i + v_t + \varepsilon_{it} \quad (12)$$

where, (i=1.....N; t=1.....T),

C_{it} is a perceived corruption index, Remit represents remittance as percentage of GDP, X_{it} represents a set of control variables based on existing corruption literature, μ_i is a country specific unobservable effect, v_t shows time specific factor and ε_{it} is an i.i.d. disturbance term. Expected sign for key variable of interest are given as $\beta_1 > 0$; $\beta_2 < 0$.

4. Estimation Techniques

Ordinary Least Squares (OLS) has a problem of omitted variable bias. If regional, country or some group specific factors affect corruption levels, explanatory variables would capture the effects of these factors and estimates would not represent the true effect of explanatory variables. This analysis is based on 2SLS tech-

nique of estimation which addresses the issue of endogeneity and its covariance between independent variables, where error term is not equal to zero. The problem of omitted variables bias is addressed by use of alternative econometric techniques, such as, Random Effects and system GMM.

The study mainly focuses the Generalized Method of Moments (GMM) estimation technique that has been developed for dynamic panel data analysis. This technique has introduced the work of Holtz-Eakin, et al. (1990), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1997). GMM control for endogeneity of all explanatory variables, allows the inclusion of lagged dependent variables as regressors and accounts for unobserved country-specific effects. For GMM estimation sufficient instruments are required. Following the standard convention in literature, equations (11) and (12) are estimated by using lagged first difference as instrument.

V. Results and Discussion

Estimation in following steps is proceeded as: The key variable of interest that is remittance is estimated first, second, the cross-sectional estimations are conducted, initially to capture the cross-sectional variations and later, the replicated estimations for the panel data taken. Third, the alternative econometric techniques are used to assess the robustness of results, and address possible problems of endogeneity. Fourth, the dummy variables are used to control the regional effects for seven regions: East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, South Asia, Sub-Saharan Africa, Europe and others. Fifth, an extensive list of corruption determinants is introduced, while performing sensitivity analysis. However, to limit the paper, only some selected control variables are used. Sixth, the quantile regression analysis is used to explore the distributional profile of dependent variable (corruption).

Table 1 reports the results for corruption and remittance of 122 countries, over the period 1984 to 2014. It is found that remittance exerts positive influence on corruption, and parameters estimate for remittance which is significant at 10 per cent level of significance. The coefficient on remittance is about 0.025 implying that one standard deviation increase in remittance is associated with an increase in corruption of 0.33 points, or 25 per cent of a standard deviation, in the corruption index.

Regression results regarding corruption and economic development relationship confirm negative and significant relationship. In countries where income is relatively low, the economy generates minimal wealth for average citizens. Low average income creates structural incentives for corrupt behavior. The inverse relationship between economic development and corruption is an empirical regularity [see, Treisman (2000), Serra (2006), MacDonald and Majeed {(2011), (2014)}]. The impact of rule of law and the government spending is negative and

significant. Table 2 controls for regional effects where coefficient on remittance (0.025) remains positive and is significant in all regressions. The value of R-square is reasonably high. Table 3, conducts a sensitivity analysis by controlling further corruption determinants. The coefficients on remittance consistently remain same, (0.025), and significant. Positive role of military spending and ethno linguistic in affecting corruption is found, while base line findings remain unaffected. In panel setting (Table 4), it is found that the effect of remittance is positive and significant in explaining corruption. Results reported in this (Table 4) and the subsequent tables show that inclusion of many controls modifies the slope of relationship only marginally and does not affect its significance. The democracy index is negatively associated with corruption and suggesting (that is open); and free elections might contribute to keep corruption in check.

Table 5 controls the regional effects in panel setting and find that effect of remittance is consistently positive and significant in explaining corruption. Our benchmark results remain the same, while the level of significance for all parameters improves. Table 6 reports the results with Random Effects. The coefficient on remittance is similar to the bench mark analysis which is 0.025, but the level of significance improves from 10 to one per cent. The indicator for democracy turns out to be insignificant while other results remain the same.

Table 7; control the endogeneity problem using instrumental variable techniques. The coefficient on democracy turns out to be significant with the expected signs. The coefficient on remittance turns out to be positive and significant at 5 per cent level of significance. Since cross-country estimates often suffer from spurious correlation due to unobservable factors which may be relevant. It is also important to subject the results to further robustness checks. To do so a very exhaustive sensitivity analysis is conducted in the panel setting. Ten additional alternative determinants of corruption are employed to assess robustness of the bench mark findings. It is evident from Table 8 that coefficient on remittances is remarkably robust and it fluctuates between 0.019 and 0.025 at one per cent level of significance.

Mauro (1995) suggested that more ethnically fractionalized countries tend to be more corrupt. One root of the link between ethno-linguistic fractionalization and corruption can be the existence of alternative affiliations and obedient with respect to the state. Thus, in ethnically divided societies civil servants and politicians would exploit their position to favor members of their own ethnic groups. Furthermore, the divided societies tend to under-provide public goods, and this in turn, would augment dependency on special bounds to obtain essential services from the state. The current study also confirms these findings as coefficient on ethno turns out to be positive and significant at one per cent level of significance. Table 9, further provide the robustness check on relationship of remittance and corruption, using Random Effects. The coefficient on remittance is remarkably

robust and fluctuates between 0.018 and 0.023 at 5 per cent and one per cent level of significance, respectively. Results on other parameters estimate also remain slightly unaffected though coefficients fluctuate. In sensitivity analysis the effect of investment profiles turn out to be most significant. This is an assessment of factors affecting risk to investment that are not covered by other political, economic and financial risk components.

In sensitivity analysis, it is also found that government stability is an important indicator of corruption where stable governments are less prone to corruption. This is an assessment of government's ability to carry out its declared programs, and improve its worth to stay in office. This study shows that increase of one standard deviation in government stability will lead to a decrease of 0.15 in corruption index.

Results reported in Tables 10 to 12 show, both the OLS and quantile regression estimates. The parameter estimates obtained by using OLS provides a base-line of mean effects and a comparative analysis of these, with separate quantiles in conditional distribution of dependent variable (corruption), is conducted. In this study a 100 boot-strapping and heteroskedasticity-robust methods are used to obtain the heteroskedasticity-robust estimates.

Estimated models for OLS and five separate quantiles (Tables 10 to 12) have consistently a good fit, which is evident from the reported F-statistics. The hypothesis that slope parameters are jointly equal to zero and are always rejected at one per cent level. The results reveal that impact of economic development is consistent across specifications and the quantiles; and higher economic development leads to lower corruption. This finding is consistent with numerous studies [see, Serra (2006), Majeed and MacDonald {(2010), (2011)}]. In addition, both, the economic freedom and political freedom reduce corruption. The impact of larger government is to reduce corruption.

The effect of remittance is nearly/always positive, causing lower indexes; i.e., remittance is correlated with less corruption. However, its effect is not consistently significant. OLS estimates suggest that remittance matters a lot in increasing corruption, but quantile regression results do not confirm them, uniformly. Specifically, to control government spending, remittance substantially increases corruption, but only in the top top-half of the conditional distribution (among the more/most corrupt countries). As remittance inflows increase in these most corrupt nations, *ceteris paribus*, they experience an increase in corruption.

However, the effect of democracy is negative, causing lower indexes; i.e., democracy is correlated with less corruption. However, it is more significant at lower quantiles as compared to higher quintiles. This finding remains consistent, even for controlling government spending and the economic freedom. The effect of the government spending-size is significant in the upper-most quantile and is suggested within the most corrupt nations to increase size of the government, to reduce corruption.

TABLE 1
Corruption and Remittances: Cross Sectional (CS) Estimation

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.091*** (0.023)	0.037** (0.017)	0.042*** (0.015)	0.0258* (0.015)	0.025* (0.014)	0.025* (0.015)
Economic Development	-	-0.513*** (0.047)	-0.284*** (0.060)	-0.118* (0.068)	-0.060* (0.066)	-0.106* (0.068)
Democracy	-	-	-0.370*** (0.069)	-0.212*** (0.074)	-0.183** (0.070)	-0.207*** (0.074)
Bureaucracy Quality	-	-	-	-0.487*** (0.114)	-0.340*** (0.115)	-0.471*** (0.115)
Rule of Law	-	-	-	-	-0.272*** (0.072)	-
Government Spending	-	-	-	-	-	-0.0139* (0.011)
Constant	2.649*** (0.119)	6.739*** (0.384)	6.401*** (0.352)	5.599*** (0.378)	5.745*** (0.361)	5.671*** (0.392)
Observations	122	122	122	122	122	121
R-squared	0.111	0.556	0.643	0.691	0.724	0.693

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 2
Corruption and Remittances: CS Estimation with Regional Controls

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.025* (0.015)	0.026* (0.015)	0.027* (0.015)	0.027* (0.015)	0.019* (0.016)	0.019* (0.017)
Economic Development	-0.118* (0.068)	-0.106* (0.068)	-0.137* (0.073)	-0.148** (0.072)	-0.184** (0.084)	-0.186** (0.087)
Democracy	-0.212*** (0.074)	-0.207*** (0.074)	-0.213*** (0.080)	-0.220*** (0.079)	-0.248*** (0.080)	-0.250*** (0.082)
Bureaucracy Quality	-0.487*** (0.114)	-0.471*** (0.115)	-0.423*** (0.129)	-0.428*** (0.128)	-0.407*** (0.119)	-0.404*** (0.128)
Government Spending	-	-0.013 (0.011)	-0.007 (0.012)	-	-	-
E Asia & Pacific	-	-	0.208 (0.228)	0.226 (0.222)	-	-
Europe & Central Asia	-	-	-0.0004 (0.054)	0.006 (0.054)	-	0.004 (0.055)
Lat America & Caribbean	-	-	0.242 (0.173)	0.258 (0.168)	-	0.021 (0.188)
Middle East & North Africa	-	-	-	-	-0.311 (0.225)	-0.297 (0.248)
South Asia	-	-	-	-	0.227 (0.351)	0.240 (0.367)
Sub-Saharan Africa	-	-	-	-	-0.519*** (0.182)	-0.508** (0.199)
Europe	-	-	-	-	-0.213 (0.191)	-0.205 (0.207)
Constant	5.599*** (0.378)	5.671*** (0.392)	5.672*** (0.574)	5.602*** (0.561)	6.291*** (0.547)	6.252*** (0.756)
Observations	122	121	121	122	121	121
R-squared	0.691	0.693	0.699	0.700	0.723	0.723
Observations	122	122	122	122	122	121
R-squared	0.111	0.556	0.643	0.691	0.724	0.693

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 3
Corruption and Remittances: CS Estimation with Sensitivity Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Remittances	0.025* (0.015)	0.022* (0.014)	0.026* (0.015)	0.028* (0.015)	0.025* (0.015)	0.028* (0.014)	0.028* (0.014)	0.025* (0.015)
Economic Development	-0.118* (0.068)	-0.060* (0.066)	-0.106* (0.068)	-0.103* (0.068)	-0.111* (0.071)	0.020* (0.072)	-0.032* (0.073)	-0.110* (0.069)
Democracy	-0.212*** (0.074)	-0.183** (0.070)	-0.207*** (0.074)	-0.202*** (0.074)	-0.352*** (0.112)	-0.142* (0.071)	-0.209*** (0.072)	-0.198** (0.078)
Bureaucracy Quality	-0.487*** (0.114)	-0.340*** (0.115)	-0.471*** (0.115)	-0.525*** (0.115)	-0.462*** (0.113)	-0.343*** (0.112)	-0.522*** (0.111)	-0.471*** (0.117)
Rule of Law	-	-0.272*** (0.072)	-	-	-	-	-	-
Government Spending	-	-	-0.013 (0.011)	-	-	-	-	-
Urbanization	-	-	-	2.11e-09* (1.24e-09)	-	-	-	-
Economic Freedom	-	-	-	-	-0.091 (0.078)	-	-	-
Internet	-	-	-	-	-	-0.045*** (0.010)	-	-
Ethno ling	-	-	-	-	-	-	-0.161*** (0.057)	-
Military	-	-	-	-	-	-	-	-0.034 (0.060)
Constant	5.599*** (0.378)	5.745*** (0.361)	5.671*** (0.392)	5.479*** (0.382)	6.345*** (0.784)	4.384*** (0.460)	5.641*** (0.368)	5.584*** (0.380)
Observations	122	122	121	122	120	122	122	122
R-squared	0.691	0.724	0.693	0.699	0.701	0.731	0.711	0.692

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 4
Corruption and Remittances: Panel Estimation

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.071*** (0.011)	0.034*** (0.009)	0.037*** (0.008)	0.026*** (0.008)	0.021*** (0.007)	0.023*** (0.007)
Economic Development	-	-0.49*** (0.028)	-0.34*** (0.035)	-0.13*** (0.038)	-0.066* (0.038)	-0.055 (0.038)
Democracy	-	-	-0.247*** (0.036)	-0.103*** (0.036)	-0.072** (0.035)	-0.067* (0.035)
Bureaucracy Quality	-	-	-	-0.551*** (0.056)	-0.420*** (0.057)	-0.399*** (0.057)
Rule of Law	-	-	-	-	-0.26*** (0.037)	-0.25*** (0.037)
Government Spending	-	-	-	-	-	-0.021*** (0.007)
Constant	2.695*** (0.0642)	6.604*** (0.230)	6.418*** (0.222)	5.454*** (0.226)	5.553*** (0.216)	5.663*** (0.222)
Observations	509	509	509	509	509	501
R-squared	0.07	0.42	0.47	0.55	0.59	0.60

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 5
Corruption and Remittances: Panel Estimation with Regional Effects

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.021*** (0.007)	0.023*** (0.007)	0.023*** (0.007)	0.020*** (0.007)	0.020** (0.007)	0.015* (0.008)
Economic Development	-0.066* (0.038)	-0.055* (0.038)	-0.053* (0.037)	-0.056* (0.037)	-0.071* (0.039)	-0.001* (0.049)
Democracy	-0.072** (0.0350)	-0.067* (0.0352)	-0.059* (0.0347)	-0.074** (0.0344)	-0.079** (0.0347)	-0.046 (0.0358)
Bureaucracy Quality	-0.420*** (0.056)	-0.399*** (0.057)	-0.451*** (0.056)	-0.400*** (0.057)	-0.383*** (0.059)	-0.401*** (0.059)
Rule of Law	-0.265*** (0.037)	-0.251*** (0.037)	-0.265*** (0.036)	-0.290*** (0.036)	-0.275*** (0.039)	-0.240*** (0.039)
Government Spending	-	-0.021*** (0.007)	-	-	-	-
E Asia & Pacific	-	-	0.484*** (0.132)	0.513*** (0.130)	0.531*** (0.131)	0.904*** (0.253)
Europe & Central Asia	-	-	-	0.553*** (0.138)	0.583*** (0.141)	0.943*** (0.258)
Lat America & Caribbean	-	-	-	-	0.110 (0.104)	0.499** (0.244)
Middle East & North Africa	-	-	-	-	-	0.591** (0.253)
South Asia	-	-	-	-	-	0.933*** (0.309)
Sub-Saharan Africa	-	-	-	-	-	0.491* (0.262)
Europe	-	-	-	-	-	-0.008 (0.213)
Constant	5.553*** (0.216)	5.663*** (0.222)	5.423*** (0.217)	5.443*** (0.214)	5.460*** (0.214)	4.356*** (0.457)
Observations	509	501	509	509	509	509
R-squared	0.594	0.597	0.605	0.617	0.618	0.633

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 6
Corruption and Remittances: Panel Estimation with Random Effects

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.027** (0.011)	0.024** (0.010)	0.028*** (0.010)	0.029*** (0.009)	0.026*** (0.009)	0.028*** (0.009)
Economic Development	-	-0.377*** (0.048)	-0.335*** (0.050)	-0.081 (0.053)	-0.031 (0.052)	-0.001 (0.053)
Democracy	-	-	-0.107*** (0.038)	0.0290 (0.037)	0.0560 (0.036)	0.0623* (0.036)
Bureaucracy Quality	-	-	-	-0.587*** (0.058)	-0.495*** (0.060)	-0.475*** (0.060)
Rule of Law	-	-	-	-	-0.210*** (0.040)	-0.210*** (0.040)
Government Spending	-	-	-	-	-	-0.031*** (0.009)
Constant	2.873*** (0.102)	5.772*** (0.385)	5.862*** (0.355)	4.649*** (0.353)	4.746*** (0.343)	4.916*** (0.351)
Observations	509	509	509	509	509	501
Countries	122	122	122	122	122	121

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 7
Corruption and Remittances: Panel Estimation (IVE)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.023** (0.010)	0.023** (0.011)	0.020** (0.010)	0.018* (0.009)	0.018* (0.010)	0.015* (0.009)
Economic Development	-0.145*** (0.040)	-0.146*** (0.041)	-0.142*** (0.041)	-0.0652* (0.042)	-0.0656 (0.042)	-0.0745* (0.042)
Democracy	-0.095** (0.037)	-0.095** (0.037)	-0.105*** (0.037)	-0.069* (0.038)	-0.069* (0.038)	-0.071* (0.038)
Bureaucracy Quality	-0.524*** (0.059)	-0.524*** (0.059)	-0.537*** (0.059)	-0.395*** (0.060)	-0.396*** (0.060)	-0.402*** (0.060)
Rule of Law	-	-	-	-0.255*** (0.040)	-0.255*** (0.040)	-0.238*** (0.039)
Government Spending	-	-	-	-0.011* (0.009)	-0.011* (0.009)	-0.017* (0.008)
Sargan- Test	59.04 (0.05)	68.24 (0.05)	-	59.63 (0.05)	68.24 (0.05)	-
Hansen- Test	-	-	55.21 (0.06)	-	-	55.21 (0.06)
Constant	5.601*** (0.249)	5.604*** (0.252)	5.650*** (0.247)	5.737*** (0.257)	5.743*** (0.260)	5.842*** (0.252)
Observations	394	394	394	387	387	387
Countries	0.550	0.550	0.550	0.589	0.589	0.587

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 8
Corruption and Remittances: Panel Estimation: Sensitivity Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Remittances	0.023*** (0.007)	0.024*** (0.007)	0.018*** (0.008)	0.017*** (0.008)	0.023*** (0.007)	0.021*** (0.007)	0.018*** (0.007)	0.026*** (0.010)
Economic Development	-0.055 (0.038)	-0.054 (0.037)	-0.040 (0.040)	-0.110*** (0.043)	-0.041 (0.039)	-0.066* (0.038)	-0.072* (0.038)	-0.101 (0.062)
Democracy	-0.067* (0.0352)	-0.063* (0.034)	-0.014 (0.046)	-0.096*** (0.036)	-0.072** (0.034)	-0.073** (0.037)	-0.061* (0.034)	-0.113** (0.052)
Bureaucracy Quality	-0.399*** (0.057)	-0.454*** (0.056)	-0.423*** (0.0567)	-0.403*** (0.062)	-0.442*** (0.057)	-0.420*** (0.057)	-0.392*** (0.056)	-0.298*** (0.083)
Rule of Law	-0.251*** (0.037)	-0.265*** (0.036)	-0.272*** (0.037)	-0.275*** (0.040)	-0.231*** (0.039)	-0.265*** (0.038)	-0.260*** (0.037)	-0.262*** (0.056)
Government Spending	-0.021*** (0.007)	-	-	-	-	-	-0.0247*** (0.00726)	-0.0145 (0.0118)
Urbanization	-	2.56e-09*** (6.85e-10)	-	-	-	-	-	-
Economic Freedom	-	-	0.074** (0.037)	-	-	-	-	-
Net	-	-	-	0.010*** (0.002)	-	-	-	-
Ethno ling	-	-	-	-	-0.076** (0.032)	-	-	-
Military in Politics	-	-	-	-	-	0.001 (0.033)	-	-
Trade Openness	-	-	-	-	-	-	0.003*** (0.001)	-
Military Spending	-	-	-	-	-	-	-	0.004 (0.007)
Constant	5.663*** (0.222)	5.429*** (0.216)	4.915*** (0.388)	5.963*** (0.257)	5.582*** (0.216)	5.553*** (0.219)	5.626*** (0.220)	6.132*** (0.382)
Observations	501	509	505	436	509	509	501	257
R-squared	0.597	0.605	0.596	0.583	0.598	0.594	0.606	0.584

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 9
Corruption and Remittances: Panel Estimation: Sensitivity Analysis: Random Effects

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Remittances	0.023** (0.009)	0.019** (0.009)	0.023** (0.009)	0.022** (0.009)	0.020** (0.008)	0.019** (0.009)	0.018** (0.009)	0.021** (0.009)	0.023** (0.009)
Economic Development	-0.148*** (0.053)	-0.157*** (0.052)	-0.136** (0.053)	-0.140*** (0.054)	-0.225*** (0.050)	-0.120** (0.054)	-0.0971* (0.052)	-0.109** (0.053)	-0.110** (0.053)
Democracy	0.038 (0.036)	0.012 (0.036)	0.064* (0.037)	0.058 (0.037)	-0.067* (0.034)	0.071* (0.038)	0.0672* (0.035)	0.0595* (0.035)	0.044 (0.035)
Bureaucracy	-0.600*** (0.057)	-0.598*** (0.056)	-0.587*** (0.057)	-0.598*** (0.057)	-0.589*** (0.052)	-0.567*** (0.058)	-0.503*** (0.057)	-0.584*** (0.056)	-0.578*** (0.056)
Quality	0.006*** (0.001)	0.004*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.002** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)
Trade	5.21e-09*** (0.000)	4.40e-09*** (0.000)	5.42e-09*** (0.000)	5.38e-09*** (0.000)	4.23e-09*** (0.000)	5.15e-09*** (0.000)	5.42e-09*** (0.000)	4.99e-09*** (0.000)	5.09e-09*** (0.000)
Urbanization	-	0.075*** (0.018)	-	-	-	-	-	-	-
Government Stability	-	-	-0.043** (0.019)	-	-	-	-	-	-
Internal Conflict	-	-	-	-0.040* (0.020)	-	-	-	-	-
External Conflict	-	-	-	-	-	-	-	-	-
Investment	-	-	-	-	0.170*** (0.016)	-	-	-	-
Profile	-	-	-	-	-	-0.094** (0.036)	-	-	-
Military in Politics	-	-	-	-	-	-	-0.226** (0.038)	-	-
Rule of Law	-	-	-	-	-	-	-	-0.180** (0.037)	-
Religion in Politics	-	-	-	-	-	-	-	-	-0.132** (0.035)
Ethno	-	-	-	-	-	-	-	-	4.753*** (0.345)
Linguistic	4.570*** (0.344)	4.270*** (0.346)	4.686*** (0.350)	4.785*** (0.373)	4.612*** (0.321)	4.493*** (0.346)	4.684*** (0.331)	4.963*** (0.356)	506
Constant	506	506	506	506	506	506	506	506	506
Observations	506	506	506	506	506	506	506	506	506

Note: The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 10
Corruption and Remittances: CS estimation: OLS vs. Quintile Regression: specification 1

Variables	OLS	Q0.1	Q0.25	Q0.50	Q0.75	Q0.9
Remittances	0.026*** (0.008)	0.026 (0.013)	0.019 (0.012)	0.022 (0.014)	0.034*** (0.010)	0.035*** (0.011)
PCY	-0.130*** (0.0387)	-0.034 (0.062)	-0.129** (0.058)	-0.187*** (0.066)	-0.115** (0.055)	-0.095** (0.043)
Democracy	-0.103*** (0.036)	-0.210*** (0.060)	-0.218*** (0.051)	-0.119* (0.062)	-0.076* (0.058)	0.018 (0.049)
Bureaucracy Quality	-0.551*** (0.056)	-0.658*** (0.086)	-0.535*** (0.083)	-0.504*** (0.096)	-0.527*** (0.081)	-0.584*** (0.066)
R-Squared	0.74	0.60	0.60	0.46	0.44	0.41
Adj. R-Square	0.73	-	-	-	-	-
F-Test	83.96 (0.000)	37.94 (0.000)	37.40 (0.000)	78.66 (0.000)	43.87 (0.000)	22.62 (0.000)
Observations	509	509	509	509	509	509

Note: Dependent Variable is corruption perception index from ICRG. Regressions include observations of country level data of 120-122 economies. Quantile regression results are based upon 100 bootstrapping repetitions. Lower quantiles (e.g., Q 0.1) signify less corrupt nations. All regressions include an intercept term but the results are not reported. F-statistics and associated p-values are reported for the test of all slope parameters jointly equal to zero. The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 11
Corruption and Remittances: CS estimation: OLS vs. Quintile Regression: specification 2

Variables	OLS	Q0.1	Q0.25	Q0.50	Q0.75	Q0.9
Remittances	0.038*** (0.0088)	0.051 (0.014)	0.042 (0.011)	0.035** (0.013)	0.025** (0.011)	0.007*** (0.012)
PCY	-0.292*** (0.036)	-0.197*** (0.055)	-0.286*** (0.047)	-0.324*** (0.055)	-0.255*** (0.050)	-0.275*** (0.042)
Democracy	-0.227*** (0.036)	-0.390*** (0.051)	-0.299*** (0.044)	-0.225*** (0.055)	-0.173*** (0.054)	-0.067 (0.050)
Government Spending	-0.038*** (0.008)	-0.042 (0.010)	-0.047* (0.010)	-0.037*** (0.012)	-0.032*** (0.012)	-0.042*** (0.012)
R-Squared	0.73	0.60	0.56	0.56	0.42	0.38
Adj. R- Square	0.72	-	-	-	-	-
F-Test	79.15 (0.000)	32.56 (0.000)	59.96 (0.000)	37.07 (0.000)	38.12 (0.000)	26.47 (0.000)
Observations	501	501	501	501	501	501

Note: Dependent Variable is corruption perception index from ICRG. Regressions include observations of country level data of 120-122 economies. Quintile regression results are based upon 100 bootstrapping repetitions. Lower quantiles (e.g., Q 0.1) signify less corrupt nations. All regressions include an intercept term but the results are not reported. F-statistics and associated p-values are reported for the test of all slope parameters jointly equal to zero. The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

TABLE 12
Corruption and Remittances: CS estimation: OLS vs. Quintile Regression specification 3

Variables	OLS	Q0.1	Q0.25	Q0.50	Q0.75	Q0.9
Remittances	0.035*** (0.009)	0.052 (0.011)	0.0370 (0.010)	0.025** (0.010)	0.018*** (0.013)	0.022*** (0.017)
PCY	-0.330*** (0.038)	-0.345*** (0.039)	-0.332*** (0.043)	-0.340*** (0.046)	-0.304*** (0.061)	-0.325*** (0.069)
Democracy	-0.231*** (0.049)	-0.458*** (0.054)	-0.406*** (0.056)	-0.265*** (0.060)	-0.117 (0.084)	-0.051 (0.105)
Economic Freedom	0.027 (0.042)	-0.105** (0.046)	-0.045* (0.050)	-0.001 (0.052)	-0.038 (0.070)	-0.075 (0.088)
R-Squared	0.73	0.61	0.56	0.44	0.40	0.40
Adj. R- Square	0.72	-	-	-	-	-
F-Test	76.97	35.57 (0.000)	37.73 (0.000)	31.96 (0.000)	29.07 (0.000)	20.87 (0.000)
Observations	505	505	505	505	505	505

Note: Dependent Variable is corruption perception index from ICRG. Regressions include observations of country level data of 120-122 economies. Quantile regression results are based upon 100 bootstrapping repetitions. Lower quantiles (e.g., Q 0.1) signify less corrupt nations. All regressions include an intercept term but the results are not reported. F-statistics and associated p-values are reported for the test of all slope parameters jointly equal to zero. The standard errors are given in parentheses (*), (**), and (***) indicate statistical significance at 10%, 5% and 1% levels, respectively.

VI. Conclusion

The literature on causes of corruption has identified many factors that help to explain worldwide existence of corruption. However, the role of remittances in determining corruption has been virtually ignored. In particular, the literature has not yet examined the role of distribution of corruption across countries in explaining the link of remittances with corruption. The study conducts a comprehensive analysis to explain the possible relationships between international remittance and corruption with special focus on distribution of depended variable in explaining this relationship. Both the cross sectional and panel data sets were used over a long period, therefore, a variety of econometric techniques are used as robustness checks and to address the problem of endogeneity.

The results show that remittances exert a positive and significant influence on corruption levels. This effect arises because the presence of remittance expands the revenue base and government finds it less costly in this situation to appropriate resources for its own purposes. This is especially true when the household has access to nontaxable exogenous resources that they can use to finance the purchase of goods that are substitutes for public services. In other words, access to remittance income makes government corruption less costly for domestic households to bear, and consequently such corruption is likely to increase. The results also support the earlier findings in literature on sources of corruption, but also provide new insights. The analysis of distributional profile of corruption shows that among the least corrupt countries, remittances do not appear to increase corruption but significantly promote corruption among most corrupt nations.

Following research questions posted by the study, we find out that remittance increase corruption. However, this study does not find sufficient evidence to accept the hypotheses that increase in remittances increase corruption in uniform way across the distribution. The effect of remittance seems to matter more in more/most corrupt countries while it is not significant in less/least corrupt countries. In this study, government expenditures appear to have negative effect on corruption. However, this effect is more significant in more corrupt countries. Our findings are robust to alternative econometrics techniques, to regional effects and different samples specifications.

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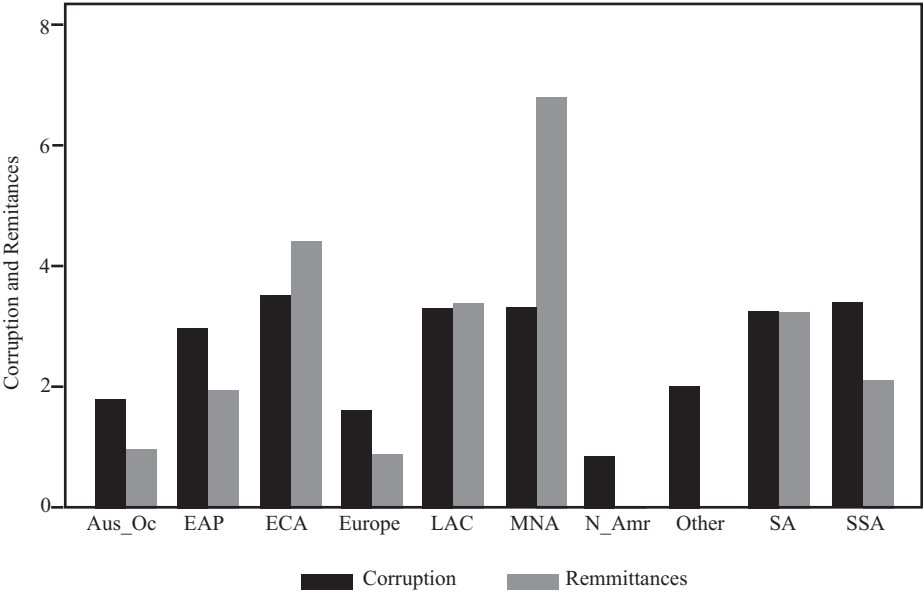
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APPENDIX

TABLE A-1
Description of Variables

Variables	Definitions	Sources
Per capita real GDP	Per capita real GDP at constant prices of the year 2000.	[1]
Credit as % of GDP	Credit as % of GDP represents Claims on the non-financial private sector/GDP.	[3]
Trade Liberalization	It is the sum of exports and imports as a share of real GDP.	[1]
Corruption	ICRG index 0-6 scale; where 6 indicate high degree of corruption and 0 indicate no corruption.	[2]
Democracy	ICRG index 0-6 scale; where 6 indicate high degree of democracy.	[2]
Military in Politics	ICRG index 0-6 scale; higher risk ratings (6) indicate a greater degree of military participation in politics and a higher level of political risk.	[2]
Religion in Politics	ICRG index 0-6 scale; higher ratings are given to countries where religious tensions are minimal.	[2]
Ethnic Tensions	ICRG index 0-6 scale; higher ratings are given to countries where tensions are minimal.	[2]
Rule of Law	ICRG index 0-6 scale; where 6 indicate high degree of law and order.	[2]
Bureaucracy Quality	ICRG index 0-4 scale; where 4 indicate high degree of law and order.	[2]
Government Stability	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	[2]
Socioeconomic Conditions	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	[2]
Investment Profiles	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	[2]
Internal Conflict	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	[2]
External Conflict	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	[2]
Economic Freedom	ICRG index 0-7 scale.	[4]
Government Spending	General government final consumption expenditure (% of GDP).	[1]
Remittances	Workers' remittances and compensation of employees, received (% of GDP).	[1]
Military Spending	Military expenditure (% of GDP).	[1]
Urbanization	Urban population.	[1]
Internet	Internet users.	[1]

Sources: [1] World Bank, World Development Indicators online data base, 2014; [2] International Country Risk Guide, PRS group; [3] International Financial Statistics (IFS) databases. (2014); [4] Fraser Institute (2014).



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FIGURE - 1